Research Journal of Pharmaceutical, Biological and Chemical Sciences, 2015, vol.6, N4, pages 8-17

Adsorption of methylene blue by biochar produced through torrefaction and slow pyrolysis from switchgrass

Valeeva A., Grigoryan B., Bayan M., Giniyatullin K., Vandyukov A., Evtyugin V.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

The present work involves a study of sorption of methylene blue (MB) by charcoal samples produced through torrefaction and pyrolysis processes from switchgrass (Panicum virgatum). The adsorption of MB was determined using the spectrometric analysis method at various pH, temperature values and MB concentrations. The heat treatment temperature during biochar production significantly influenced the surface chemistry of biochars indicating that biochar samples, based on their thermal history alone, can behave significantly differently in the rhizosphere or in their ability to adsorb pollutants. The pH of the solution containing MB significantly affected its adsorption by biochars but trends were markedly different. The concentration of MB was also affected adsorption behavior of the two charcoals. The results indicate that biochars can be produced with desired properties to solve specific agricultural or environmental needs.

Keywords

Adsorption activity, Adsorption isotherm, Charcoal, Methylene blue, Pyrolisis